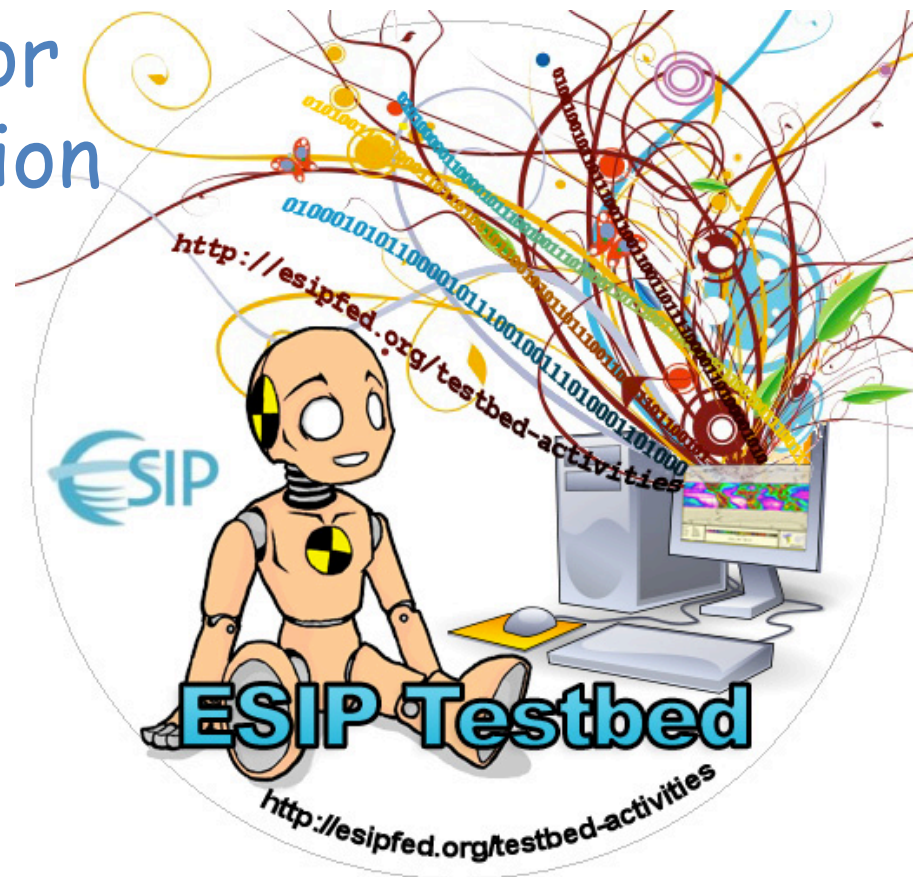


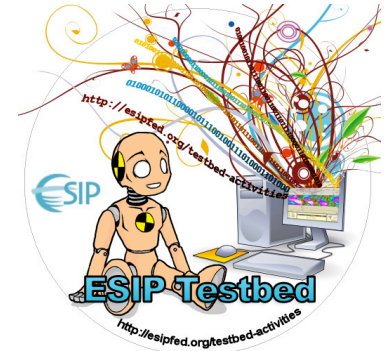
# The ESIP Testbed

An Infrastructure for  
Community Collaboration

ESIP Winter Meeting  
January 2012

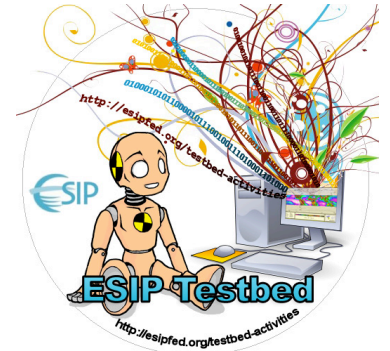


# Agenda



- Quick Survey
- Overview (Ken)
- Front Office – Big Picture Perspective (Carol)
- Brief Overview of Current Tasks (Task leads)
- Plans for Cloud Resources and Testing (Phil)
- Open Discussion (and quicker survey)

# Quick Survey

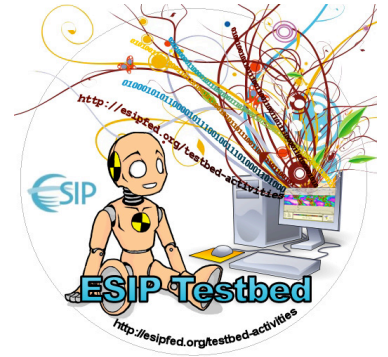


Who had no idea that an ESIP Testbed exists?

# Quick Survey

If you were aware of the Testbed, have you ever used or interacted with any of the Testbed activities?





# ESIP Testbed Overview

How we got to this point.

# Organizational

- Originated from **the Products and Services Committee**
  - To encourage the development, use and improvement of **best science practices** to ensure the quality, usability, and breadth of data and resultant information, products, and services
  - To provide a Federation-wide forum for defining, developing and evaluating requirements for Federation **Earth science products**
  - To provide a Federation-wide forum for defining, developing and evaluating requirements for **product services and user services**
- Testbed Purpose
  - Provide an **environment to prototype...**
    - Standards (ISO)
    - Services (e.g. expert skills database)
    - Protocols (e.g. casting)
    - Technologies (e.g. drupal)
  - **Explore** best practices (E.g. data identifiers)
  - Provide a forum for **innovative collaboration** across ESIP
  - Improve **visibility and access** to products and services

# Previous Activities

- Earlier funded activities
  - Expert Skills Database
  - Unique Data Identifiers
  - Semantic Registration of Data and Services
  - Application-specific Portals
- More information
  - <http://wiki.esipfed.org/index.php/Testbed>

# 2011 Efforts

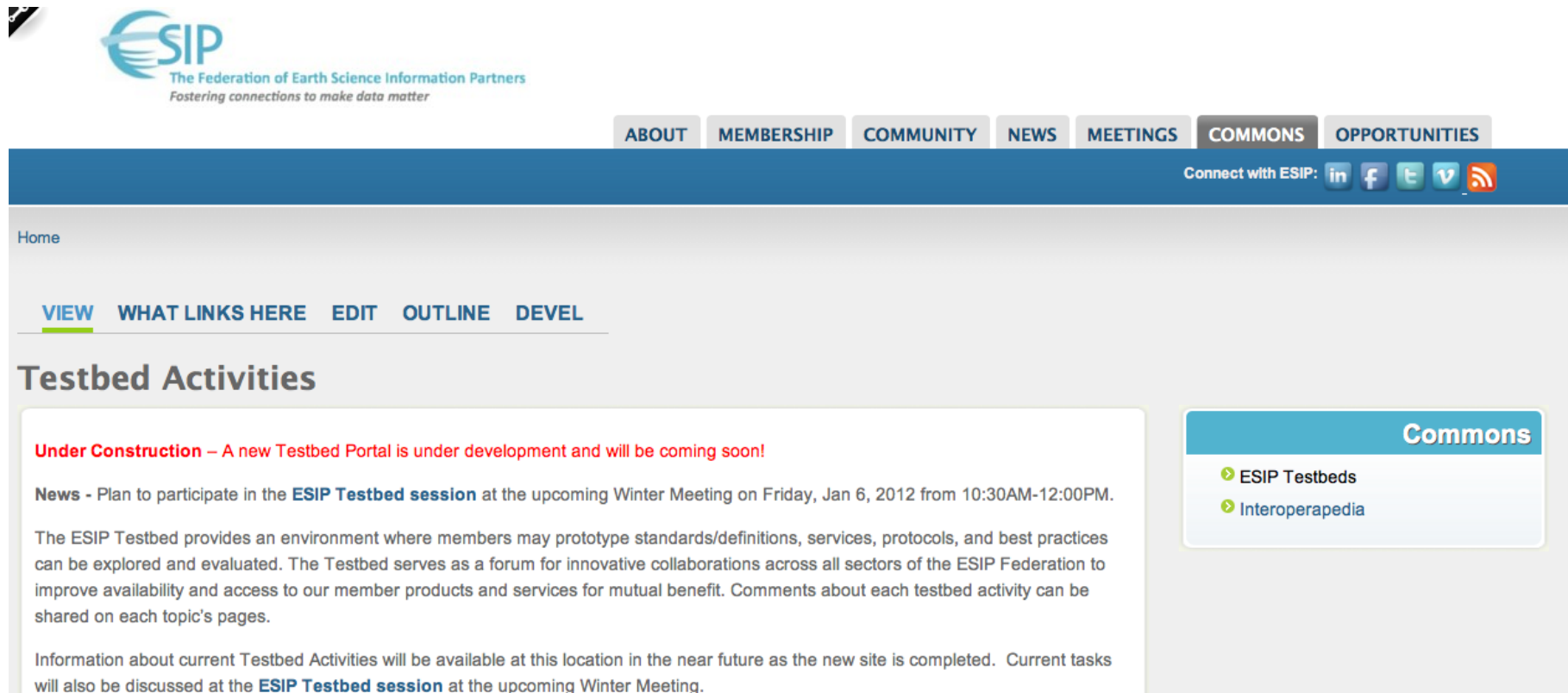
- Proposal for funding of new activities
  - Testbed Portal Development
  - Discovery Services and Clients
  - Data and Information Quality
  - Re-usable Metadata Authoring Tool
  - Data Stewardship
- RFP for Implementation of Tasks
- Establishment of Testbed Configuration Board
- More Information
  - <http://wiki.esipfed.org/images/d/d5/Pstestbed11rev9.pdf>



# 2012 and Beyond...

- Improve Visibility and Function of Testbed
- Work with Implementation Teams
- Integrate Information with ESIP Commons
- Consider New Activities/Tasks
- More Information
  - <http://esipfed.org/testbed-activities>






# New Testbed Home...



The screenshot shows the ESIP Testbed Activities page. At the top left is the ESIP logo with the text "The Federation of Earth Science Information Partners" and "Fostering connections to make data matter". A navigation bar contains links for ABOUT, MEMBERSHIP, COMMUNITY, NEWS, MEETINGS, COMMONS, and OPPORTUNITIES. Below this is a blue bar with social media icons and the text "Connect with ESIP:". The main content area has a "Home" link and a set of tabs: VIEW (selected), WHAT LINKS HERE, EDIT, OUTLINE, and DEVEL. The "Testbed Activities" section contains a red notice about a new portal under construction, a news item about an upcoming session, and a paragraph describing the testbed's purpose. A sidebar on the right titled "Commons" lists "ESIP Testbeds" and "Interoperapedia".

ESIP  
The Federation of Earth Science Information Partners  
Fostering connections to make data matter

ABOUT MEMBERSHIP COMMUNITY NEWS MEETINGS COMMONS OPPORTUNITIES

Connect with ESIP:     

Home

[VIEW](#) [WHAT LINKS HERE](#) [EDIT](#) [OUTLINE](#) [DEVEL](#)

## Testbed Activities

**Under Construction** – A new Testbed Portal is under development and will be coming soon!

**News** - Plan to participate in the **ESIP Testbed session** at the upcoming Winter Meeting on Friday, Jan 6, 2012 from 10:30AM-12:00PM.

The ESIP Testbed provides an environment where members may prototype standards/definitions, services, protocols, and best practices can be explored and evaluated. The Testbed serves as a forum for innovative collaborations across all sectors of the ESIP Federation to improve availability and access to our member products and services for mutual benefit. Comments about each testbed activity can be shared on each topic's pages.

Information about current Testbed Activities will be available at this location in the near future as the new site is completed. Current tasks will also be discussed at the **ESIP Testbed session** at the upcoming Winter Meeting.

### Commons

- ▶ ESIP Testbeds
- ▶ Interoperapedia

<http://esipfed.org/testbed-activities>

# ESIP Federation Testbed

Big Picture Perspective

# ESIP Federation Core Strengths

- Knowledge and tech transfer by experts
- Innovation by community
- Community-driven approach identifies common needs across organizations, agencies, disciplines & works toward common solutions (i.e. incubator)
- Adoption by community is applied in local contexts

# What Is A Testbed?

- A testbed is a structured approach for evaluating technology, software or even processes.
- In ESIP world, a testbed offers a platform for assessing member- and community-generated assets.

# Why an ESIP Federation Testbed?

- Structured approach to evaluating ideas/ approaches/technologies
- Service to members and sponsors
- Community expertise tapped (as opposed to each member going it alone)
- Community-driven activities = broader potential for standard approaches
- Shared resource = efficiencies gained

# Testbed Outputs

- Shared (vetted) resources for use by community & sponsors
- Recommendations for approaches (e.g. best practices, community conventions)
- Identifies new projects and collaboration opportunities

# What It's Going to Look Like?

- Big Question!
- Challenge is for Products & Services  
Committee to identify Testbed platform needs
  - Computational
  - Tracking Mechanisms
  - Management/Policies
- Invitation to other ESIP groups to utilize Testbed



# Current Tasks: Discovery Services

Sponsor: Discovery Cluster

Task Lead: Christine White and ESRI team

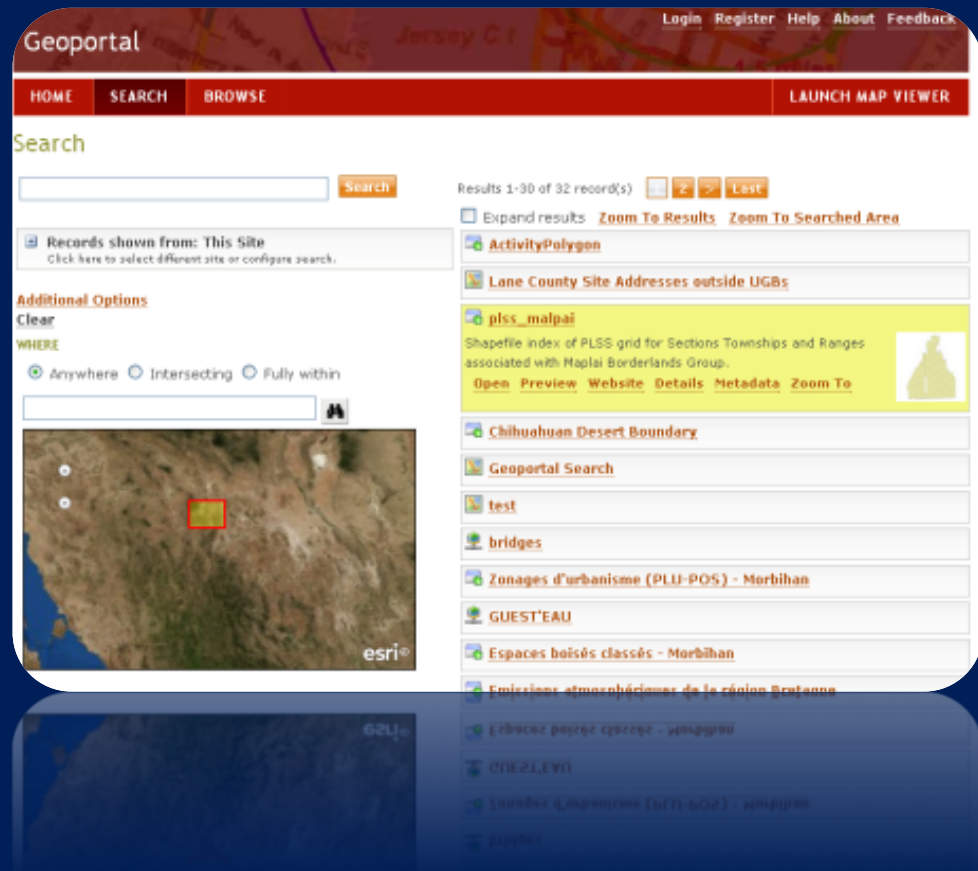
## Discovery Cluster Task 2

- **Esri Geoportal Server** solution
- **Out of the box** resource advertisement, discovery, CSW endpoint, REST endpoint, OpenSearch endpoint
- **Customizations** for federated search of OpenSearch endpoints, data casting, and service casting



# Esri Geoportal Server

- Web access point, but also protocol-based endpoints
- User management
- Metadata resource management
- Resource discovery
- Federated search
- Harvesting
- No-cost system setup possible with Open Source software



# Current Tasks: Testbed Portal

Sponsor: Product & Services Committee

Task Lead: Chen Xu and GMU team

# Develop and Deploy a Testbed Portal

*Supported by the ESIP Products and Services Committee & the ESIP Testbed Configuration Board*

Chen Xu, Jing Li, Chaowei Yang

Center of Intelligent Spatial Computing for Water/Energy Science (CISC)

George Mason University


# Issues and Goals

- Issues
  - Current testbed portal is wiki-based and functionality is limited;
  - Need a portal that is more visible and accessible for the public;
  - Need an environment that is more configurable and usable for testbed task developers.
- Goals
  - Support ESIP members to interact with hosted testbed activities;
  - Support interactivities between ESIP members and testbed task developers;
  - Make ESIP testbed activities more visible to the public.

# Benefits for the Earth Science User Community

- For the testbed developers
  - A environment for hosting funded activities;
  - A communication platform between the developers and the ESIP members.
- For the ESIP members
  - Conveniently access to various funded testbed activities;
  - Provide comments and feedback on the demonstrated technologies.
- For the public
  - A portal for easy access to testbed news and demonstrations.

# Testbed Task Introduction


**ESIP TESTBED**  
Fostering connections to make data matter

[Objectives](#)
[Tasks](#)
[NEWS](#)
[Communities](#)
[Project Management](#)

**User login**

Username: \*

Password: \*

[Create new account](#)
[Request new password](#)

**Home**

### Task One - Deploy a Testbed Portal

Currently access to Testbed activities is primarily provided through links on the Products and Services Committee section of the ESIP Federation Wiki. While this approach works fine if users realize the Testbed is sponsored by the Products and Services Committee, it is otherwise somewhat hidden and difficult to discover from outside of the wiki environment. We propose two pursue two objectives with a new Testbed environment; (1) In an effort to make the ESIP Testbed more visible and accessible to ESIP members and the general public, a CMS-based portal will be deployed that will host the various funded activities and be available to support other activities as deemed appropriate by the Testbed Configuration Board. Access controls on the portal will be configured to provide controlled access for developers and testers while at the same time providing public access for users and other participants. (2) Additionally, we propose to implement a new flexible operating environment for the Testbed that will allow for more customized configuration for each task (in necessary) through the use of virtualization services, as well as making use of cloud-based resources as available. Some tasks will have requirements for system dependencies that may be collide with other tasks, so the availability of virtualized systems will allow more specialized configurations for tasks with those requirements. A common operating area will be available to host the less complicated configuration of other tasks as necessary. The Testbed Configuration Board will manage long-term maintenance and configuration of the Testbed portal.

**Events**


January 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

**Upcoming events**

- ESIP Winter Meeting Testbed Session (1 day) [more](#)

# Testbed Community Forums


**ESIP TESTBED**  
Fostering connections to make data matter

[Objectives](#)
[Tasks](#)
[NEWS](#)
[Communities](#)
[Project Management](#)

**User login**

Username: \*

Password: \*

[Create new account](#)
[Request new password](#)

**Home - Forums**

### Communities

Login to post new content in the forum.

Forum	Topics	Posts	Last post
<input checked="" type="checkbox"/> <b>Testbed Portal</b> Discussions about portal related issues.	1	1	2 weeks 4 days ago by c.xu
<input checked="" type="checkbox"/> <b>Testbed Tasks</b> Discussions related to Testbed tasks.	0	0	n/a
<input checked="" type="checkbox"/> <b>Outreach</b> Communication to the general public.	0	0	n/a

**Events**


January 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
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22	23	24	25	26	27	28
29	30	31				

**Upcoming events**

- ESIP Winter Meeting Testbed Session (1 day) [more](#)

# Testbed Project Management


**ESIP TESTBED**  
Fostering connections to make data matter

[Objectives](#)
[Tasks](#)
[NEWS](#)
[Communities](#)
[Project Management](#)

**c.xu**

- My account
- My projects
- Create content
- Administer
- Log out

**Home**

### Task One - Deploy a Testbed Portal

View
Edit
Maintainers

Submitted by c.xu on Fri, 2011-12-16 14:32

Currently access to Testbed activities is primarily provided through links on the Products and Services Committee section of the ESIP Federation Wiki. While this approach works fine if users realize the Testbed is sponsored by the Products and Services Committee, it is otherwise somewhat hidden and difficult to discover from outside of the wiki environment. We propose two pursue two objectives with a new Testbed environment; (1) In an effort to make the ESIP Testbed more visible and accessible to ESIP members and the general public, a CMS-based portal will be deployed that will host the various funded activities and be available to support other activities as deemed appropriate by the Testbed Configuration Board. Access controls on the portal will be configured to provide controlled access for developers and testers while at the same time providing public access for users and other participants. (2) Additionally, we propose to implement a new flexible operating environment for the Testbed that will allow for more customized configuration for each task (in necessary) through the use of virtualization services, as well as making use of cloud-based resources as available. Some tasks will have requirements for system dependencies that may be collide with other tasks, so the availability of virtualized systems will allow more specialized configurations for tasks with those requirements. A common operating area will be available to host the less complicated configuration of other tasks as necessary. The Testbed Configuration Board will manage long-term maintenance and configuration of the Testbed portal.

**Resources**

- Home page
- Read documentation
- Look at screenshots

**Development**

- View pending patches

**Attachment**

Attachment	Size
Task1-rewrite-final.pdf	53.42 KB

**Events**

January 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

**Upcoming events**

- ESIP Winter Meeting Testbed Session (1 day) [more](#)

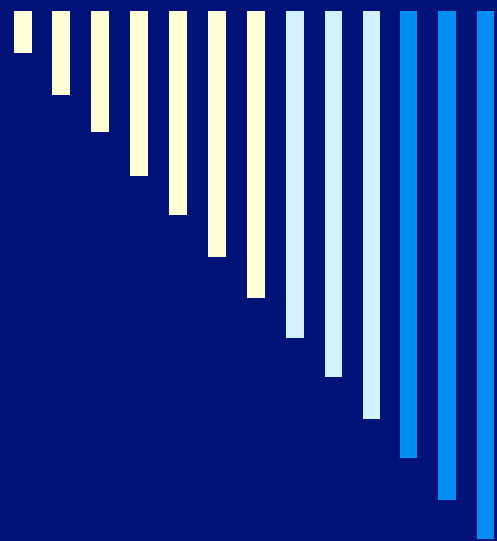
Add new comment



# Current Tasks: Data Stewardship

Sponsor: (**New**) Data Stewardship Committee

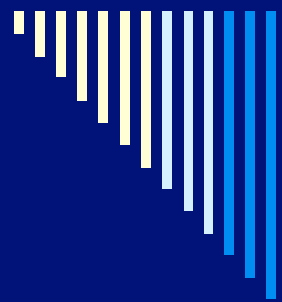
Task Lead: Nancy Hoebelheinrich and team



# Data Stewardship & Preservation Cluster Identifier Testbed Activities

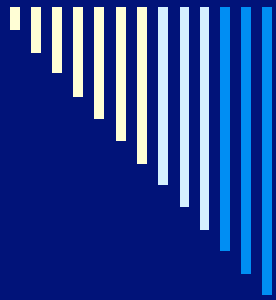
**A Report for the ESIP Winter 2012  
Meeting in Washington DC by  
Nancy Hoebelheinrich**

---



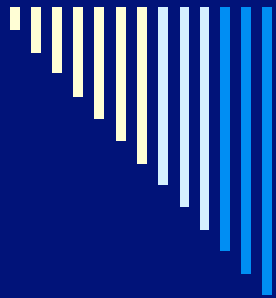
# Synopsis of Project

- Task: explore & document the operational & implementation issues resulting from assignment of citable Identifiers to data content resources at both the data set and granule / component level
- Two data sets used: 1 photographic images, 1 MODIS time series data
- So far, IDs assigned for 2.5 of the 9 ID schemes evaluated in DS&P cluster paper published in 2010 (DOI, ARK, PURL)



# Issues noted to date

- ❑ IDs need to be known, else they don't identify (link to splash page, added to MD, etc.)
- ❑ When should IDs be assigned to the granule / component level?
- ❑ Maintenance issues, e.g., changes in descriptive MD that could result in changed citation, whose responsibility to make changes,
- ❑ Value for services associated with each ID scheme (resolution services, MD changes, making MD available to indexing services)



# References

- [http://wiki.esipfed.org/index.php/  
Preservation and Stewardship](http://wiki.esipfed.org/index.php/Preservation_and_Stewardship) = sponsor
- [http://wiki.esipfed.org/index.php/  
Interagency Data Stewardship/  
Identifiers#Summary of Issues and Re  
sults](http://wiki.esipfed.org/index.php/Interagency_Data_Stewardship/Identifiers#Summary_of_Issues_and_Results) = tracking of project
- Contacts: Nancy Hoebelheinrich  
[\[nhoebel@kmotifs.com\]](mailto:nhoebel@kmotifs.com), Greg Janée  
[\[gjanee@eri.ucsb.edu\]](mailto:gjanee@eri.ucsb.edu)

# Current Tasks: Metadata Editor

Sponsor: Information Technology and  
Interoperability Committee

Task Lead: Jerry Pan and team



# A Generic Metadata Editor Supporting System Using Drupal CMS

Jerry Yun Pan<sup>1</sup>, Nigel Banks<sup>2</sup>

<sup>1</sup> Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge,  
TN 37831-6407

<sup>2</sup> Discovery Garden Inc., 118 Sydney Street, Charlottetown, Canada, C1A  
1G431-6407



# The Goal

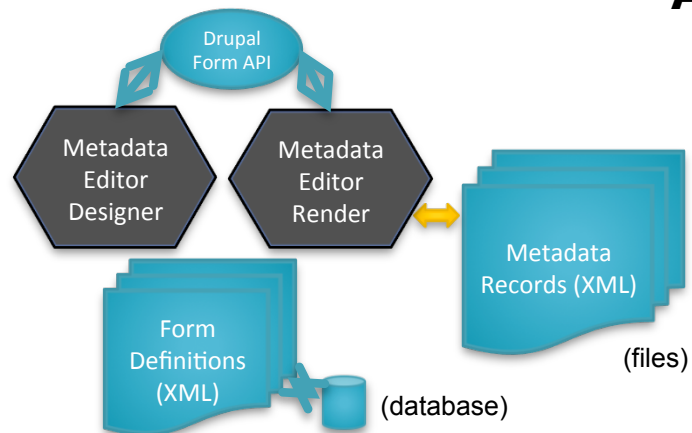
*Develop a generic, reusable software system to facilitate the support for multiple metadata standards and their variations*



# Approach



**Drupal Content Management System (CMS) and its Forms API as the foundation framework**





# Features & Status

- Editor from design GUI (“Editor of Editors”)
- Choose subset of a Schema (a “Profile”)
- Custom Tags supported
- Stand-alone editor, or easy Integration to any Drupal-based system through APIs
- Flexible Theming (with Drupal themes and JQuery UI themes)



# Work Plan

- Complete ISO 19115 support with sample profiles
- Complete Wizard forms
- Auto completion and “pick-list” support
- Import and export
- Integration with Drupal Node/View system (potential)
- Auto-generation of form definition from a schema file (potential)

# Current Tasks: Data and Information Quality

Sponsor: Information Quality Cluster

Task Lead: Abdelmounaam Rezgui and GMU  
team

# A Classification/Annotation Scheme for Data and Service Quality

A. Rezgui, Z. Gui, M. Sun, C. Yang

Center of Intelligent Spatial Computing for Water/Energy Science (CISC)  
George Mason University

Sponsored by:

ESIP Products and Services Committee &  
ESIP Testbed Configuration Board

# IT Problem Addressed

- Large number of ESIP data and services available online
  - Data/service consumers need a quality-aware system (source, accuracy, performance, reliability, etc.)
- Objective
  - Provide quality measures for ESIP products and services
- Approach
  - Develop an automatic classification/annotation system that assesses, monitors, and accurately reports on the quality of ESIP data and services

# Benefits to Earth Science User Community

- **Quality Model** for ESIP Products and Services

- **For Data**

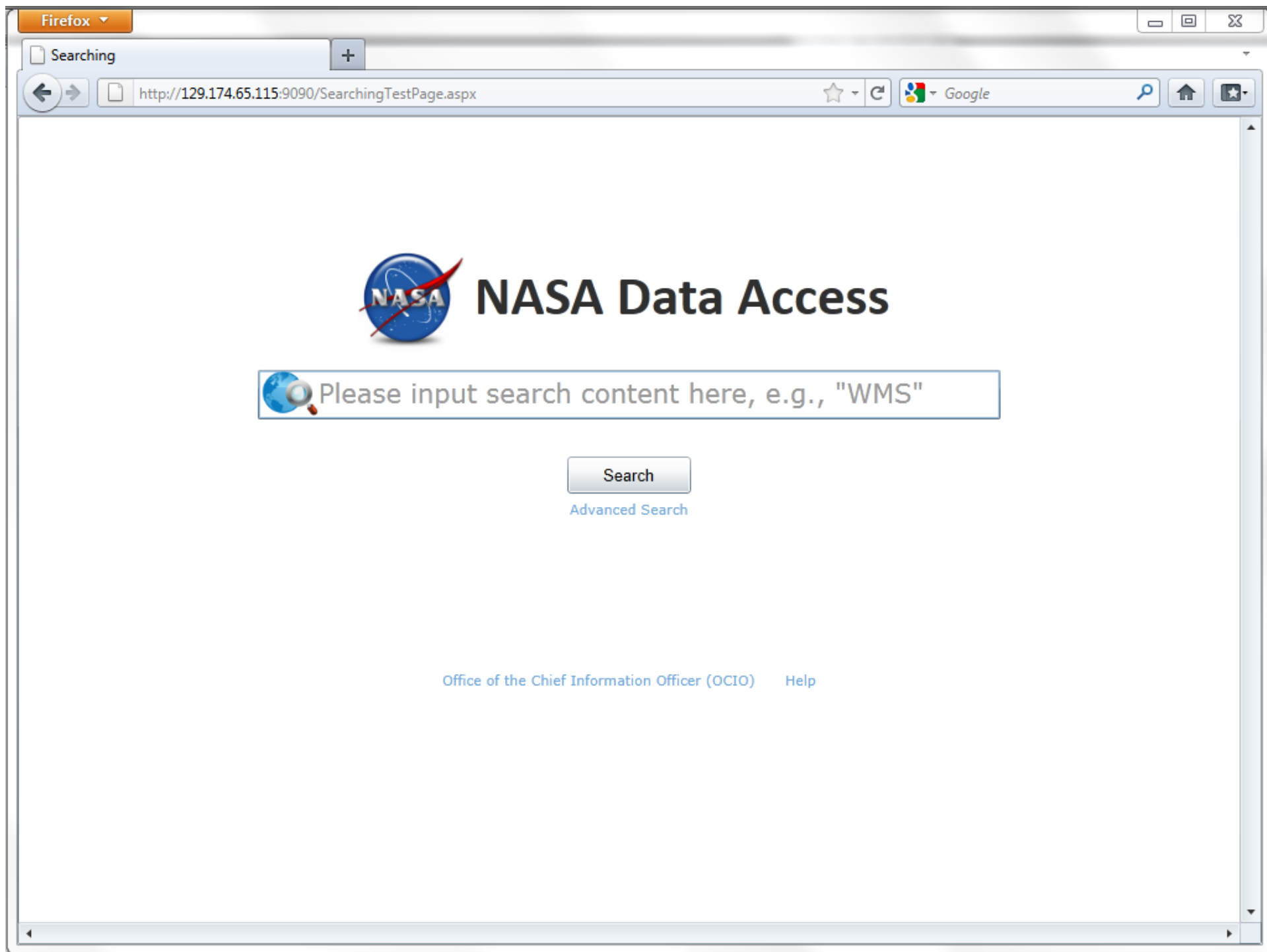
- Quality metrics, e.g., accuracy, precision, timeliness
    - Draw from several standards such as
      - ISO 8000 (international standard for data quality),
      - FIPS (Federal Information Processing Standard) spatial data quality standard,
      - ISO 19113 (for describing the quality of geographic information),
      - ISO 19114 (for evaluating and reporting the quality of geographic information)

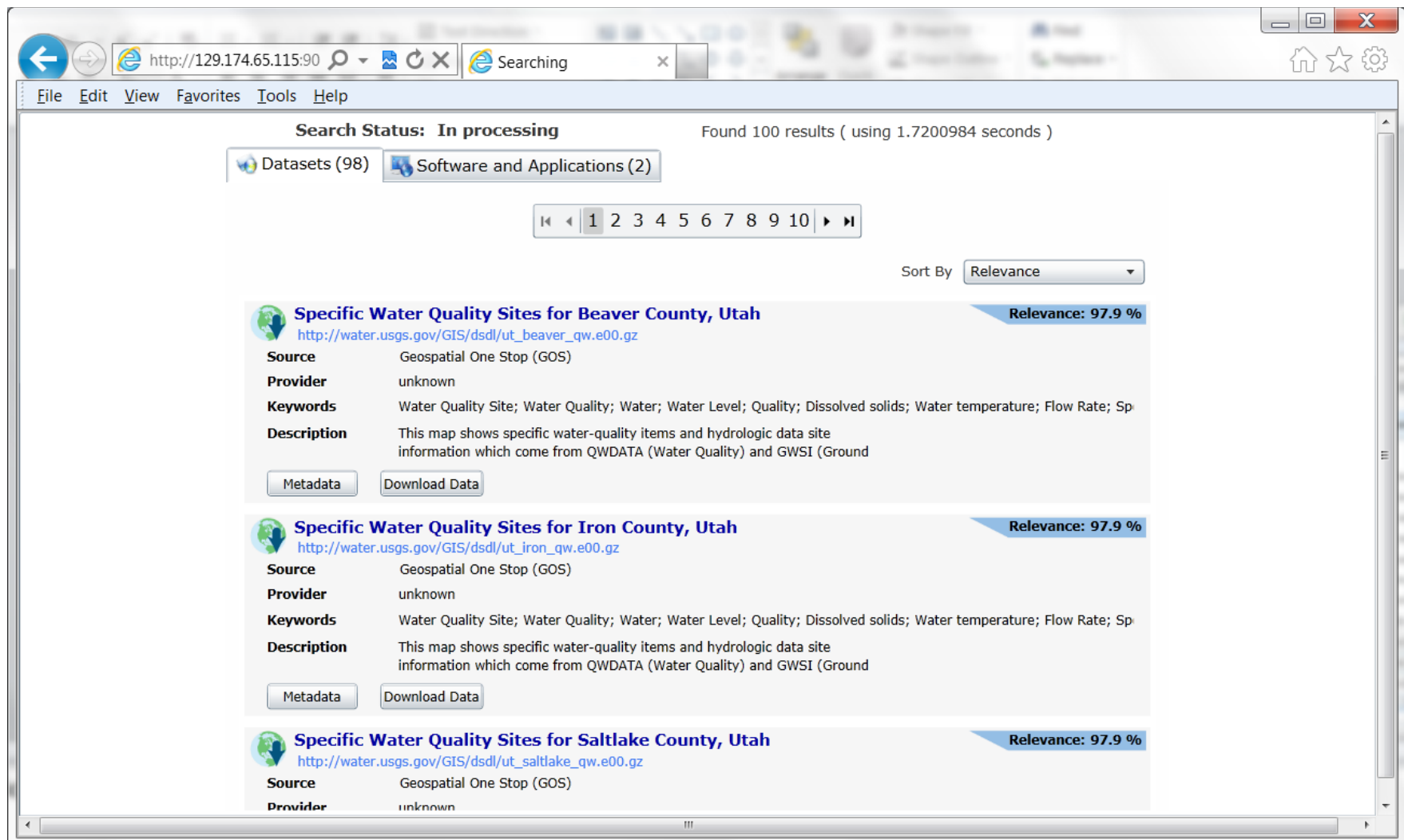
# Benefits to Earth Science User Community

## – For Services

- Quality metrics, e.g., performance, usability, reliability
- Draw from established standards such as
  - OASIS WSQM (Web Service Quality Model)
  - ISO 9126 (software quality model).
- Metadata Quality
- User Feedback
- **Classification Engine** that automatically derives the quality of ESIP products and services based on the developed model.







# GUI (results page)

The image shows a screenshot of a web-based search results page for 'water wms'. The page is annotated with several labels pointing to specific UI elements:

- Search Status Bar**: Points to the top bar showing 'Search Status: Finished' and 'Retrieved 16 [ of 16 ] results ( using 1.0990526 seconds )'.
- Resource Type Tabs**: Points to the 'Web Services (16)' tab.
- Sorting Rules**: Points to the 'Sort By' dropdown menu set to 'Relevance'.
- Provider ID**: Points to the 'Provider' field in the first result.
- Quality Rank**: Points to the 'Quality Rank' field in the first result.
- Resource Type ID**: Points to the 'Resource Type ID' field in the first result.
- Classified Record Lists**: Points to the list of search results.
- Metadata View Button**: Points to the 'Metadata' button in the first result.
- Visualization Tools Buttons**: Points to the 'SWP', 'OpenLayers', and 'World Wind' buttons in the first result.
- Relevance**: Points to the 'Relevance: 97.0 %' score for the first result.
- Quick Search Bar for Societal Benefit Area**: Points to the 'SBA' sidebar on the right, which lists categories like Agriculture, Biodiversity, Climate, Disasters, Ecosystems, Energy, Health, Water, and Weather.

The search results are displayed in a table-like format with columns for Source, Provider, Keywords, and Description. The first result is 'NURE\_Water\_Geochemistry' with a relevance of 97.0%. The second result is 'Atlas of the Cryosphere: Northern Hemisphere' with a relevance of 87.0%. The third result is 'Geology of Denmark' with a relevance of 83.0%.



water

Search

[Advanced Search](#)

**Search Status: Finished**

Retrieved 5000 [ of 271046 ] results ( using 41.1683547 seconds )

[Search Summary](#)

Datasets (4987)

Web Services (2)

Websites and Documents (8)

Software and Applications (3)

« 1 »

Sort By Relevance



### Atlas of the Cryosphere: Northern Hemisphere

Relevance: 87.0 %

[http://nsidc.org/cgi-bin/atlas\\_north?](http://nsidc.org/cgi-bin/atlas_north?)

**Source** GEOSS Clearinghouse (CLH)  
**Provider** National Snow and Ice Data Center  
**Keywords** Arctic; Cryosphere; Earth Science; Frozen Ground; Glaciers; Ice Extent; Ice Sheets; Northern Hemisphere; Oceans;  
**Description** The National Snow and Ice Data Center (NSIDC) Atlas of the Cryosphere is a map server that provides data and information pertinent to the frozen regions of Earth, including monthly climatologies of sea ice extent and

Metadata

SWP

OpenLayers

World Wind



### Atlas of the Cryosphere: Northern Hemisphere

Relevance: 87.0 %

[http://nsidc.org/cgi-bin/atlas\\_north?](http://nsidc.org/cgi-bin/atlas_north?)

**Source** GEOSS Clearinghouse (CLH)  
**Provider** unknown  
**Keywords** Arctic; Cryosphere; Earth Science; Ice Extent; Ice Sheets; Northern Hemisphere; Oceans; Polar; Sea Ice; Sea Ice Cc  
**Description** The National Snow and Ice Data Center (NSIDC) Atlas of the Cryosphere is a map server that provides data and information pertinent to the frozen regions of Earth, including monthly climatologies of sea ice extent and

Metadata

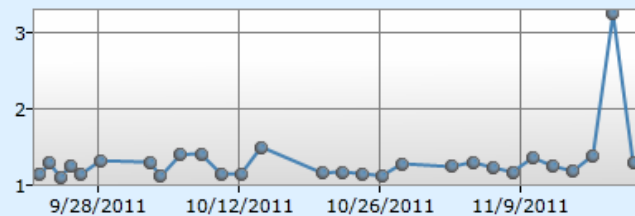
« 1 »

SBA

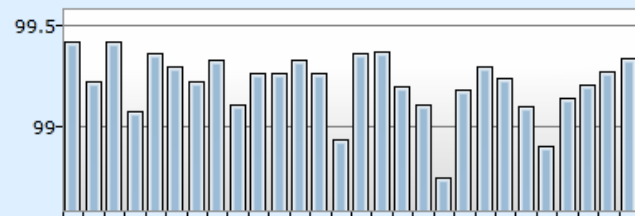
- › Agriculture
- › Biodiversity
- › Climate
- › Disasters
- › Ecosystems
- › Energy
- › Health
- › Water
- › Weather

## Atlas of the Cryosphere: Northern Hemisphere

Response Time(s)



FGDC Score(%)



From: 9/22/2011 15 To: 11/20/2011 15 Timespan 60

Query

Latest

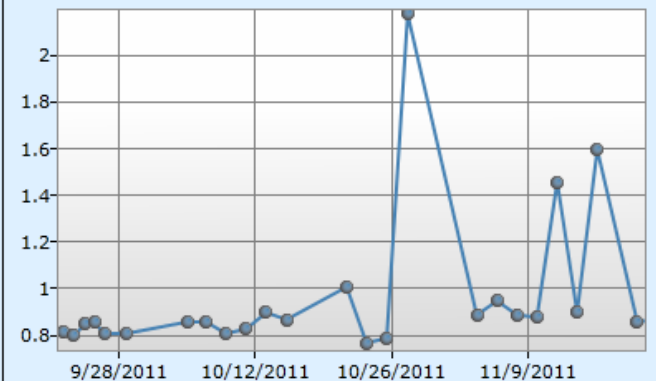
Previous

<< Hide Layers QoS Panel

### All layers (97)

- ☐ satellite imagery, Jan
- ☐ satellite imagery, Jan
- ☐ satellite imagery, July
- ☐ satellite imagery, July
- ☐ sea ice extent, Januar
- ☐ sea ice extent, Februar
- ☐ sea ice extent, March
- ☒ sea ice extent, April (1
- ☐ sea ice extent, May (1
- ☐ sea ice extent, June (1
- ☐ sea ice extent, July (1

Response Time(s)

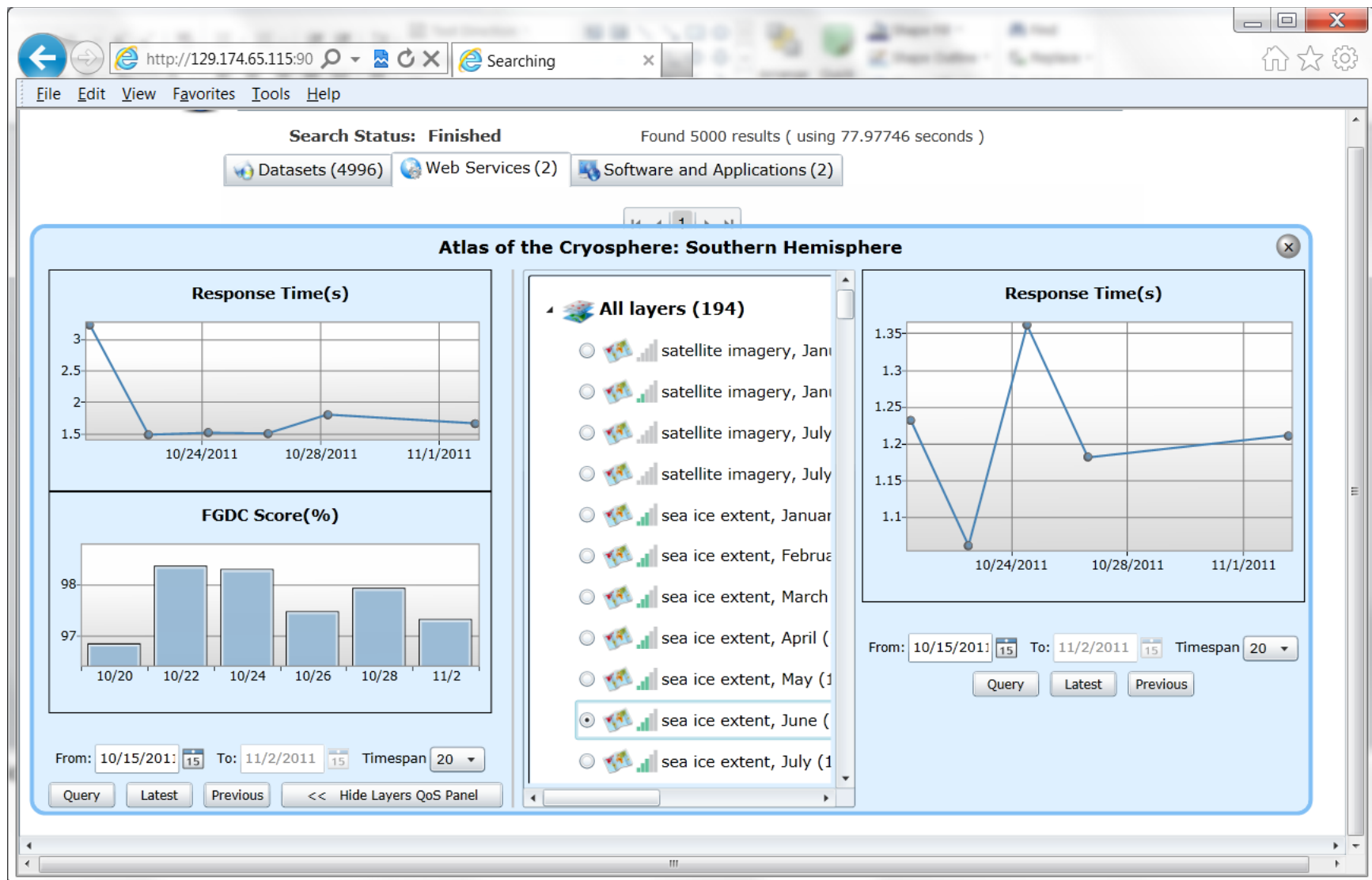


From: 9/22/2011 15 To: 11/20/2011 15 Timespan 60

Query

Latest

Previous



# Future Tasks: Cloud Resources

Sponsor: Cloud Computing Cluster

# ESIP Cloud Computing Testbed Initiative

A progress test, discussion, report and collaboration about what is needed to support a cloud computing testbed for producing lessons learned and best practice for ESIP members to assess, test, and adopt cloud platforms for their research, development, and education:

- Develop community consensus matrix of requirements for cloud computing adoption,
- Identify cloud resources (Amazon, Microsoft, Nebula, Private Cloud),
- Identify potential applications to be running on the resources,
- An execution plan with a target of presenting in the summer meeting and EarthCube.



# ESIP Cloud Computing Testbed Initiative

Scientific and Application Use Cases

Testbed Cloud Resources (Commercial, Government, Community, etc.)

Coordinated through monthly telecons

Define Cloud Computing Requirements

A virtual collaborative infrastructure

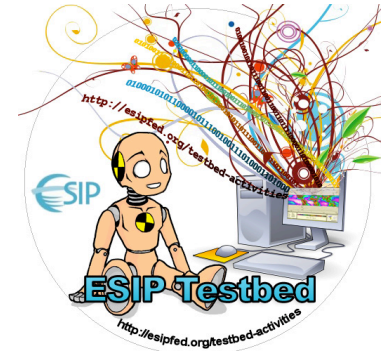
A cloud computing knowledge base by and for ESIP members

# Expected Results

- Documents for
  - How to run cloud computing services.
  - How to migrate Earth science applications onto cloud environment and how to best leverage the cloud.
  - Help us mature the open source foundation.
  - Develop a community agreed matrix for testing cloud.
- Cloud computing resources
- Best configured virtual images for a number of applications
- EarthCube
- Summer meeting

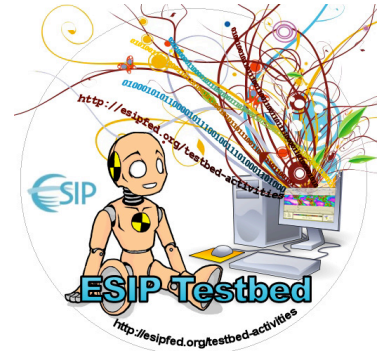
Future Tasks:[Your Ideas...]

# Quick Wrap-up Survey



Who would have interest in utilizing the Testbed to try out products and services or discover information from existing activities?

# Quick Wrap-up Survey



What would you want to get out of the Testbed?

# Open Discussion